Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (withdrawn) A method of generating energy, comprising:

applying a pulse of energy in the vicinity of a reaction surface to start self-sustaining chemical reactions that create highly vibrationally excited molecules, the chemical reactions sustaining themselves until reactants of the chemical reactions are depleted:

transferring at least some of vibration energy of the highly vibrationally excited molecules to carriers in a conducting surface to form hot carriers in pulses; and

converting energy of the hot carriers to useful work.

2. (canceled)

3. (withdrawn) The method of generating energy as claimed in claim 1, further including:

collecting the useful work.

4. (withdrawn) The method of generating energy as claimed in claim 1, wherein the applying includes applying a pulse of energy with pulse duration shorter than thrice the time it takes for energy vibrations on the reaction surface to equilibrate with its substrate.

5. (withdrawn) The method of generating energy as claimed in claim 1, wherein a distance between a reaction surface and a converter of hot electron energy is equal to or

less than thrice the aggregate energy diffusion length of electrons generated by the pulse of energy.

6. (withdrawn) The method of generating energy as claimed in claim 1, wherein the pulse of energy includes hot electrons, photons, or phonons, or combinations thereof.

7. (withdrawn) The method of generating energy as claimed in claim 1, wherein the applying includes applying pulses of energy in intervals, wherein the interval between the pulses is shorter than a time associated with the dissociation of adsorbates.

8. (withdrawn) The method of generating energy as claimed in claim 1, wherein the method further includes:

selecting a material reaction surface that has a high sticking coefficient.

9. (withdrawn) The method of generating energy as claimed in claim 1, wherein the applying includes applying a pulse of energy in the vicinity of a reaction surface to create reaction initiators in the reaction surface, and the stimulating occurs in response to the reaction initiators in the reaction vicinity of the reaction surface.

10. (withdrawn) The method of generating energy as claimed in claim 9, wherein the reaction initiators includes reaction intermediates.

11. (withdrawn) The method of generating energy as claimed in claim 9, wherein the reaction initiators include reaction autocatalysts.

12. (withdrawn) The method of generating energy as claimed in claim 9, wherein the reaction initiators include translationally hot species.

13. (withdrawn) The method of generating energy as claimed in claim 9, wherein the method further includes flooding the reaction surface with reagents.

14. (withdrawn) The method of generating energy as claimed in claim 13, wherein the reagents include fuel.

15. (withdrawn) The method of generating energy as claimed in claim 9, wherein the reaction initiators are created in pulses with durations less than twenty nanoseconds.

16. (withdrawn) The method of generating energy as claimed in claim 1, wherein the stimulating includes stimulating reactions in a region surrounding the reaction surface to create highly vibrationally excited molecules near a converter.

17. (withdrawn) The method of generating energy as claimed in claim 16, wherein a distance between the converter and the region where the stimulating occurs is within thrice the diffusion distance of the highly vibrationally excited molecules.

18. (withdrawn) The method of generating energy as claimed in claim 1, wherein the method further includes:

allowing exhausts formed from the reactions to leave a collector surface; and

generating at least one watt/cm^2 of power from the reactions.

19. (withdrawn) The method of generating energy as claimed in claim 2, wherein the hot electrons are transported as carriers in one of semiconductor and insulator, and cause chemical reactions to create additional hot electrons.

20. (currently amended) A device for generating energy, comprising:

~~an emitter that stimulates and initiates reactions in pulses, the emitter having a reaction surface;~~

an emitter having at least a reaction surface, the emitter operable to emit hot electrons in pulses into the reaction surface to initiate chemical reactions;

a reaction region surrounding the emitter operable to contain the chemical reactions initiated on the reaction surface, the chemical reactions producing highly vibrationally excited products; and

a collector near the reaction region, the collector comprising at least a conductor whose first surface at least partly bounds the reaction region and whose second surface is in contact with a semiconductor, the thickness of the conductor from the first surface to the second surface being sufficiently thin to permit hot electrons emitted from highly vibrationally excited products to the conductor to travel through the conductor into the semiconductor, charging the semiconductor to a useful forward bias that can be converted into electrical energy, the electrical energy being greater than energy input to the emitter to emit hot electrons that initiate the chemical reactions.

~~wherein fuel and oxidizer reacting near the reaction surface causes creation of hot electrons in pulses, and the collector converts kinetic energy of the hot electrons into useful work.~~

21. (original) The device of claim 20, wherein the reaction region includes a surface of the emitter.

22. (original) The device of claim 20, wherein the reaction region includes a surface of the collector.

23. (original) The device of claim 20, wherein the emitter and the collector are on a same surface.

24. (original) The device of claim 20, wherein the emitter and the collector are a same one device.

25. (original) The device of claim 20, wherein the reaction region is formed as a V-channel by the surrounding collector.

26. (original) The device of claim 20, wherein the reaction region is partly enclosed by the surrounding collector.

27. (original) The device of claim 20, wherein the emitter includes:

an insulator;

a first electrode connected to a first side of the insulator; and

a second electrode connected to a second side of the insulator, the second electrode forming the reaction surface,

wherein energy pulses can be applied across the first electrode and the second electrode to stimulate reaction on the reaction surface.

28. (original) The device of claim 27, wherein the insulator has thickness dimension that is less than three times the energy diffusion length of hot electrons traversing the insulator.

29. (original) The device of claim 20, wherein the emitter includes one or more of a forward biased diode, a metal-insulator-metal device, a semiconductor-insulator-metal device, a semiconductor-metal device, an optical device, and a quantum well.

30. (original) The device of claim 20, wherein the device further includes a strip transmission line connected to the emitter for driving energy pulses into the emitter.

31. (original) The device of claim 30, wherein the strip transmission line includes a dielectric material in contact with one or more electrodes.

32. (original) The device of claim 30, wherein the strip transmission line includes a dispersive transmission line designed to compress pulses.

33. (original) The device of claim 20, wherein the reaction surface includes a catalyst.

34. (original) The device of claim 20, wherein the collector includes a reaction surface.

35. (original) The device of claim 20, wherein the emitter includes a semiconductor whose p side is ohmically or almost ohmically attached to the reaction surface.

36. (original) The device of claim 20, wherein the emitter includes an electrically pulsed solid state optically emitting diode.

37. (currently amended) The device for generating energy as claimed in claim 20, wherein the collector further includes:

~~a conductor surface;~~

a conductor electrode connected to the conductor ~~surface~~;

~~a collector semiconductor connected to the second conductor surface;~~ and

a collector electrode in ohmic contact with the semiconductor,

wherein the hot electrons created in the collector ~~travel via the conductor surface and the conductor electrode to~~ cause the semiconductor to become forward biased and produces useful voltage across the collector electrode and the conductor electrode.

38. (canceled)

39. (currently amended) The device of claim 20, wherein the collector further includes:

~~a conductor having a surface; and~~

a quantum well structure directly connected to the first conductor surface.

40. (currently amended) The device of claim 20, wherein the collector includes:

~~a conductor having a surface; and~~

a Schottky diode directly connected to the second conductor surface.

41. (currently amended) The device of claim 20, wherein the ~~collector includes a~~ first conductor ~~conducting~~ surface is supplied with one or combination of fuel and oxidizer additives.

42. (currently amended) The device of claim 20, wherein the ~~collector includes a~~ first conducting surface ~~with~~ includes superlattice structures.

43. (currently amended) The device of claim 20, wherein the ~~collector includes a conducting surface~~ conductor is formed from material with a Debye temperature property chosen to optimize the ratio of hot electrons and phonons generated upon exposure to reaction products.

44. (original) The device of claim 20, wherein the collector collects electromagnetic radiation.

45. (currently amended) The device of claim 20 ~~37~~, wherein the collector semiconductor includes:

a highly doped p+ region;

a p doped region; and

a n doped region.

46. (original) The device of claim 20, wherein the device further includes a fuel port in close proximity to the emitter.

47. (withdrawn) A method of extracting a net excess of useful work, comprising:

applying a pulse of energy in the vicinity of a reaction surface to initiate chemical reactions that sustain themselves until reactants of the chemical reactions are depleted, the chemical reactions creating highly vibrationally excited molecules;

transferring at least some of vibration energy of the highly vibrationally excited molecules to carriers in a conducting surface to form hot carriers;

repeating the applying and the transferring steps wherein hot carriers are created in pulses; and

converting energy of the hot carriers to useful work.

48. (currently amended) A device for extracting a net excess of useful work, comprising:

~~an emitter that stimulates and initiates reactions in pulses, the emitter having a reaction surface;~~

an emitter having at least a reaction surface, the emitter operable to emit hot electrons in pulses into the reaction surface to initiate chemical reactions;

a reaction region surrounding the emitter operable to contain the chemical reactions initiated on the reaction surface, the chemical reactions producing highly vibrationally excited products; and

a collector near the reaction region, comprising at least a conductor whose first surface at least partly bounds the reaction region and whose second surface is in contact with a semiconductor, the thickness of the conductor from the first surface to the second surface being sufficiently thin to permit hot electrons emitted from highly vibrationally excited products to the conductor to travel through the conductor into the semiconductor, charging the semiconductor to a useful forward bias that can be converted into electrical energy, the electrical energy being greater than energy input to the emitter to emit hot electrons that initiate the chemical reactions,

the dimension of the reaction region being such that a distance from a geometric center of the reaction region to a nearest collector surface is less than three times an energy diffusion length of the highly vibrationally excited reaction products.

~~wherein fuel and oxidizer reacting near the reaction surface causes creation of hot electrons in pulses, and the collector converts kinetic energy of the hot electrons into useful work.~~

49. (new) The device of claim 20, wherein the electrical energy is stored and used to energize the emitter to emit hot electrons.

50. (new) The device of claim 49, wherein the electrical energy is stored in one or more of capacitor, supercapacitor, battery.

52. (new) The device of claim 20, wherein the emitter is energized initially from one or more of pulse of energy, pulse of chemical reactants, reaction intermediates, autocatalysts, monopropellants, reaction stimulators, optical pulses, pulsed laser radiation, optical radiation.

53. (new) The device of claim 20, wherein the conductor includes one or more of catalysts, oxides, metals.

54. (new) The device of claim 20, wherein the conductor includes a plurality of layers of one or more materials.

55. (new) The device of claim 20, wherein the reaction surface and the first conductor surface are formed from same material.

56. (new) The device of claim 20, wherein the emitter and the collector are next to one another.

57. (new) The device of claim 20, wherein the emitter and the collector are one same component and the reaction surface is the first conductor surface.

58. (new) The device of claim 40, wherein the semiconductor forms part of the Schottky diode.